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ABSTRACT

This paper discusses the changing role of teachers and students working on the World Wide Web and outlines the following eight characteristics and associated descriptors of the engaged learning model: (1) vision of learning (responsible, strategic, energized, collaborative); (2) tasks (authentic, challenging, multidisciplinary); (3) assessment (performance based, generative, multiple measurements); (4) instructional model (interactive, generative); (5) learning context (collaborative, empathetic); (6) grouping (heterogeneous, flexible, equitable); (7) teacher roles (facilitator, guide, co-learner); and (8) student roles (explorer, apprentice, teacher/mentor, producer). SURWEB (State of Utah Resource Web), an Internet-based multimedia tool and resource database for directly involving both teachers and students in these types of engaged learning activities, is described. SURWEB was initiated in 1995 by a consortium of public and private agencies including Utah's K-12 educational service centers, institutions of higher education, West Ed Regional Education Laboratory, museums, state and national parks, and Native American tribal councils and agencies. Its growing database provides teachers with hundreds of media shows, electronic field trips, and standards-based learning units. Furthermore, the tool enables students and teachers to create and produce multimedia presentations. Web sites for a sampling of student/teacher produced media shows are listed, and guidelines for successful classroom instruction using the Web are provided. (AEF)

SURWEB: A Visual Literacy Tool which Promotes Engaged Learning for Teachers and Students

http://www.surweb.org/

Paper Presented at the
8th Annual National Conference on Creating the Quality School

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SURWEB: A Visual Literacy Tool which Promotes Engaged Learning for Teachers and Students

The promise of Internet connectivity and high capacity bandwidth with rapid access to the World Wide Web empowers teachers and students to more fully integrate technology as a regular part of classroom instruction. Through access to the incomprehensible amount of resources on the Web, teachers in Web-supported classrooms are able to:

- take students on electronic field trips;
- clarify and expand new information learned each day in the classroom;
- design lesson plans and enrichment materials in support of local and national learning standards;
- arrange for students to participate in collaborative projects with students from other schools across their state, from out-of-state, or in foreign countries; and
- provide students access to the massive collections of informational resources regularly being added to the Web.

The Changing Role of Teachers and Students Working on the Web

Contemporary education has evolved beyond the philosophy of the teacher being the all-knowing disseminator of knowledge and students as passive recipients. Internet connectivity brings to schools the dynamic of cyberspace, with teachers and students now able to access resources and databases far beyond the confines of a classroom's four walls (Garrett and Weiner, 1998; Barker, 1998)

Teachers who hope to optimize the instructional potential of the Web must employ new skills and learning strategies in their teaching that will help young people accept increased accountability to learn on their own and in cooperative groups and to draw meaningful conclusions from such inquiry. New teaching/learning methods researched in recent years as successful strategies for increasing student accountability focus on a model of "engaged learning" promoted by the North Central Regional Educational Laboratory (NCREL). Researchers at NCREL define engaged learning as "learning that involves more student interactions, more connections among institutions, more collaboration among teachers and students, and more emphasis on technology as a tool for learning" (Jones, Valdez, Nowakowski, and Rasmussen, 1994).

Learning how to learn and doing so over a lifetime is at the heart of engaged learning. The engaged learning model centers on the use of information and communications technologies as tools to assist teachers in helping students take responsibility for their own learning, become knowledge explorers, and collaborate with others to find information and to seek answers to problems. In an engaged learning model, teachers move beyond the role of knowledge dispensers and are seen as facilitators, guides, and co-learners with their students. They mediate, model, and coach their students. While making use of electronic databases and information resources beyond traditional textbooks and chalkboards, the role of teachers and students periodically change -- that is, students may become "teachers" and teachers may become "students." As engaged learners, both teachers and students become "technonauts," knowledge explorers who use technology tools to find, exchange, and analyze digital information (Barker, in press; Jones, et. al., 1994).

The eight characteristics of *engaged learning* and their associated descriptors have been identified by researchers at the North Central Educational Laboratory as follows (ISBE, 1995):

Vision of Learning: Engaged learners take responsibility for their own learning and are self-regulated. They define problems and goals that are meaningful to them, are able to work successfully in teams, and they have learned how to learn. The descriptors of a "vision of learning" include:

- Responsible: assumes that students who help define goals, design activities to reach goals, and evaluate their achievements, learn better than those who don't participate actively in constructing their own learning.
- Strategic: assumes that students who learn "how to learn" will learn better in the future.
- Energized: assumes that students who learn in an engaged learning environment find excitement and pleasure in learning and therefore learn better and seek to learn more.
- Collaborative: assumes that learners who can communicate their ideas, have empathy for others, are fair-minded, and who are self critical learn better than those who do not.

Tasks: Engaged learners participate in tasks which are authentic, challenging, and multidisciplinary.

- Authentic: assumes that the best tasks are related to real world problems, using real world technology tools, build on life experiences, and often require in-depth work.
- Challenging: assumes that learners who are engaged in complex tasks that often require extended time, learn better than those engaged in simple tasks of short duration. But, engaged learning principles can also be applied to simple tasks.
- Multidisciplinary: assumes that tasks which blend disciplines into thematic or problem-based projects cause more learning than do tasks that are narrowly defined by discipline.

Assessment: Assessment of student learning in an engaged learning model is performance based, generative, seamless and ongoing, and is based on multiple measurements.

- Performance based: assumes that when students understand and construct new knowledge from information received and create real things in the process, they learn best.
- Generative: assumes that when students help create assessments through an understanding of curriculum goals and an awareness of the differences between shallow and significant knowledge, they learn best.
- Multiple measurements: assumes that the best assessments should be multiple measurements from multiple sources.

Instructional model: In an engaged learning model, students are interactive and generative.

- Interactive: assumes that when the learner realizes that what s/he does has an effect on the instruction, then a more positive learning/teaching synergy is created.
- Generative: assumes that learner creator knowledge is better than teacher structured information.

Learning context: Engaged learners are collaborative and empathetic.

- Collaborative: assumes that in a learning community, intelligence is distributed among the members; and that the best knowledge is built through collaboration.
- Empathetic: assumes that full collaboration requires understanding of others and an active recruitment of individuals by the group.

Grouping: Engaged learners seek to work in groups which are heterogenous, flexible, and equitable.

- Heterogenous: assumes that groups made up of differing genders, cultures, learning styles, abilities, socioeconomic status, and ages cause the best learning among their members.
- Flexible: assumes that groups that are configured and reconfigured according to the purposes of instruction as a project develops provide the greatest learning opportunities for students.
- Equitable: assumes that heterogenous and flexible groupings provide the most equitable learning opportunities for individual group members.

Teacher roles: In an engaged learning environment, the classroom teacher is a facilitator, becomes a guide, and is a co-learner with students.

- Facilitator: assumes that teaches who provide resource rich environments, and a variety of learning experiences and activities cause better learning to take place.
- Guide: assumes that teachers who have and who practice the skills of mediation, modeling, and coaching enable learners to learn best
- Co-learner: assumes that teachers who collaborate with students, and who also seek to find answers to questions along with their students, effect greater learning.

Student roles: In an engaged learning setting, students become knowledge explorers, apprentices, teacher mentors themselves, and knowledge producers.

- Explorer: assumes that when learners discover concepts and apply skills by interacting with the real world and with others, they learn better than when they deal with abstractions.
- Apprentice: assumes that when learners observe, apply, and refine through practice thinking processes used by real work practitioners, the students learn better than when analyzing thought processes in an abstract context.
- Teacher/mentor: assumes that students learn more through peer tutoring.
- Producer: assumes that learners who produce real-world use products learn better than those who analyze abstract ideas, but never synthesize or create.

SURWEB: An Internet-based Resource for Engaged Learning

An excellent example of an Internet-based resource for directly involving both teachers and students in the types of engaged learning activities described above is the SURWEB multimedia tool available free on the World Wide Web. The exponential growth of the Internet with its equally rapid developments in digital media capabilities is increasingly making it easy for teachers and students to work with video, animation, music, text, still pictures, and 3D graphics for local production of hypermedia learning projects following an engaged learning mode. The SURWEB multimedia tool and resource database are available free on the Web at **<http://www.surweb.org/>**.

SURWEB is the State of Utah Resource Web initiated in 1995 by a consortium of public and private agencies including Utah's K-12 educational service centers, institutions of higher education, West Ed Regional Education Laboratory, museums, state and national parks, and Native American tribal councils and agencies. The $3.3 million project is in its third year of a five year grant funded by Federal Technology Challenge monies. From October through December 1998, SURWEB averaged about one million hits per month. Through 1999 five million hits per month are anticipated, and in 2000 the expectation is to reach 10 million hits per month (Spendlove, 1999).

SURWEB has K-12 applications far beyond the borders of Utah. Its growing archives presently include over 22,000 images with related text files. The project initially focused on national parks and monuments, geological formations, native cultures, and wildlife of western America but has since expanded to topics across the school curriculum. Its growing data base provides teachers with hundreds of media shows, electronic field trips, and standards-based learning units. Furthermore, the tool enables students and teachers to create and produce multimedia presentations for interchange with other students or for delivery in their home schools. A media basket function, standards-based test bank, and on-line tutorial are a few of SURWEB's features. The media basket allows students or teachers to capture images from anywhere on the Web, add text, and thereby produce their own media shows. A sampling of student/teacher produced media shows include:

- The Golden Spike National Historical Monument
  <http://www.surweb.org/surweb/images/gsn/coverpage/gsn.htm>

- Navajo Rugs
  <http://www.surweb.org/surweb/images/nvr/coverpage/nvr.htm>

- The Old Spanish Trail
  <http://www.surweb.org/surweb/images/OST/coverpage/OST.htm>

- Dinosaur National Monument
  <http://www.surweb.org/surweb/images/dnm/coverpage/dnm.htm>

- Zion National Park
  <http://www.surweb.org/surweb/images/zio/coverpage/zio.htm>

- Mountain Men Rendezvous
  <http://www.surweb.org/surweb/images/mtm/coverpage/mtm.htm>

- The Desert Tortoise
  <http://www.surweb.org/surweb/images/DTS/coverpage/DTS.htm>

- Native Plants and Medicine
  <http://www.surweb.org/surweb/images/npm/coverpage/npm.htm>

- Ancient Egypt
  <http://www.surweb.org/search/view_custom_show.asp?msid=354>

- Man on the Moon
  <http://www.surweb.org/search/view_custom_show.asp?msid=557>

- Fractals: The Art of Mathematics
  <http://www.surweb.org/search/view_custom_show.asp?msid=1542>

Media shows either have been or are being added in each of the following curriculum categories: agricultural, business, career guidance, dance, family and consumer science, foreign language, health science, health education, information technology, language arts, library media, marketing, mathematics, music, physical education, school-to-work, science, social studies, technology, theater, and visual arts.

Guidelines for Successful Classroom Instruction Using the Web

Successfully managing student learning in Internet connected classrooms requires extra attention and planning on the part of teachers to assure that learning activities are maximized by students. Some suggestions for successful practice includeTechnology based activities:

1. Conduct product-based activities where students gather, organize, and present information. For example, **SURWEB** can be use to archive or cache information, data can be sorted for later presentation, plus student work can be published immediately to a global audience, and is equally accessible to the student in the classroom or in the home. Similar activities will promote relevant, real life application of technology and increase intrinsic motivation of students.

2. Use online resources to affect the quantity of sources a student will use in doing research. (as opposed to the one-source approach, a single text, encyclopedia, or local expert).

3. Teach students to question their sources of information and source validity.

4. Analyze whether conclusions are consistent with the data collected.

5. Focus on activities that also meet local or national standards. Does the use of online resources strengthen student proficiency in basic skills?

6. Strengthen visual literacy by having students select and analyze details from photographs and organize information into logical sequences

Conclusion

The key to the Internet is it telecommunications capability. The Internet is about communicating with other people. While some skeptics may criticize the computer as a form of depersonalized learning, Internet-connected computers actually do more to provide learners with creative tools and put them in contact with other learners than any other telecommunications medium available. Web-connected computers promote the concept of a community of learners not only in traditional classrooms but beyond the classroom in virtual learning communities with global connections.

As educators move into the year 2000 and beyond, our nation's students need to develop skill and expertise in accessing, exchanging, and analyzing digital information resources if they hope to be successful in the world and work place of the future. Without doubt, they need exposure to today's telecommunications tools in order to master the knowledge and the technology that will make them prosper. If the technology of the printing press and resulting books revolutionized learning in the 15th century, it is the technology of the computer and the Internet which will revolutionize learning in the 21st century. As the Internet continues to evolve and as students and teachers master skills in navigating through its databases, tools, and services, the information of the world will truly be at their fingertips and before their very eyes.

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